



City of Seattle

Gregory J. Nickels, Mayor

Department of Planning and Development

D. M. Sugimura, Director

**CITY OF SEATTLE
ANALYSIS AND DECISION OF THE DIRECTOR OF THE
DEPARTMENT OF PLANNING AND DEVELOPMENT**

Technical Noise Variance

Application: Request for a technical variance from the maximum permissible sound level requirement of the Noise Control Code, Seattle Municipal Code (SMC) Chapter 25.08 during construction of the University Link light rail tunnel and station at the University of Washington Station site. This variance application pertains only to the above-ground construction activities required to support tunneling and other below-ground operations that need to take place during nighttime hours, as those hours are defined in SMC 25.08. This work will be performed by a contractor under Sound Transit's University Link Contract U220, a component of the University Link Light Rail Project.

Project No.: 3010245

Site Address: 3900 Montlake Boulevard NE

Applicant: Central Puget Sound Regional Transit Authority (Sound Transit)

SUMMARY OF PROPOSED ACTION

The proposed action is related to Sound Transit's University Link Light Rail Project which consists of 3.15 miles of double-track light rail transit alignment extending from the existing Pine Street Stub Tunnel northward to the University of Washington. The tunnel will pass below two freeways, the Lake Washington Ship Canal, Volunteer Park and numerous residential and commercial structures. Two new below ground stations with above-ground station entrances will be constructed along the route: one on Capitol Hill and the other at the University of Washington near Husky Stadium. The University Link alignment and station locations were adopted and approved by the Sound Transit Board in 2006, and also by the Seattle City Council in 2007.

On October 23, 2008, DPD issued the Analysis and Decision of the Director for Master Use Permit Application No. 3008164, which approved issuance of a Temporary Use Permit for the construction staging area and a Shoreline Substantial Development Permit for construction of the tunnels and the portion of the staging area that are within the Shoreline Environment. On February 2, 2009, DPD issued the Analysis and Decision of the Director for Master Use Permit Application No. 3008663, which approved future grading of the underground station. The current application requests a Technical Noise Variance from the nighttime noise limits in former SMC 25.08.410 and 25.08.420, so that some of the work authorized by these prior decisions can take place at night.

The running tunnels for University Link will be excavated by tunnel boring machines ("TBM") operating from the construction staging areas at the two station sites. At the University Station site (the site of this application), two separate TBMs will be launched and will simultaneously bore approximately two miles of the north-bound and south-bound tunnel terminating at the Capitol Hill Station site. Spoils from this segment of tunnel will be removed by haul trucks from the University Station construction staging site for disposal at an off-site location. A separate TBM will be launched from the Capitol Hill site and will bore the remaining one mile of north-bound and south-bound tunnel in separate drives to connect with the Pine Street Stub Tunnel. Spoils from this segment of tunnel will be removed by haul trucks from the Capitol Hill Station construction staging site for disposal at an off-site location.

To support the tunneling, excavation, and underground construction activity in the manner proposed by the applicant, a certain amount of noise-producing surface activity is necessary. As noted below, this variance does not apply to construction of above-ground structures such as the University Station surface structures or to preliminary site excavation, nor does it apply to daytime construction activities at the site.

On December 2, 2008, the applicant submitted a complete application for this technical variance to DPD. The applicant submitted additional information on March 16, 2009 and most recently on September 15, 2009. On March 2, 2009, the Seattle City Council approved Ordinance 122923 which amended several sections of SMC 25.08, the Noise Control Code. This variance application is vested to the provisions in SMC Chapter 25.08 in effect on December 2, 2008. This technical variance is requested pursuant to the former SMC 25.08.590 and 25.08.640 to allow construction noise generated on site to exceed the maximum permissible sound level during nighttime hours (between 10:00 p.m. and 7:00 a.m. on weekdays and between 10:00 p.m. and 9:00 a.m. on weekends and legal holidays) as specified in the former SMC 25.08.410 and 25.08.420. These provisions of the Code limit nighttime project sound levels to 45 dBA in receiving areas classified as "Residential".

Based on the most current anticipated construction schedule provided by Sound Transit, the duration of the requested variance involving nighttime construction activities is expected to extend over an approximate two-year time period, potentially starting as early as late 2010 and ending by early 2013.

BACKGROUND

It is the express intent of the City as stated in the Noise Control Code to "control the level of noise in a manner that promotes commerce; the use, value, and enjoyment of property; sleep and repose; and the quality of the environment." SMC 25.08.010.

The Department of Planning and Development ("DPD") held a public hearing on May 28, 2009 to take public comment on the variance application. As required by DPD Director's Rule 10-2005, at least twenty (20) days prior to the May 28th public hearing, notice was published in the Daily Journal of Commerce and the Seattle Times. At the same time notice was mailed to residents within the immediate vicinity of the sound sources covered by the application. Notice was also published in DPD's Land Use Information Bulletin on April 30, 2009.

Public comments and letters from citizens and an attorney and noise consultant representing local neighbors were received and considered. A written transcript of the public hearing and copies of all written public comments received by DPD are contained in the DPD file. Public comments on the variance application were considered only in relation to the noise impacts of the proposed activity. Other public comments received regarding other construction-related impacts from the project, such as light, glare, dust, and off-site truck hauling impacts are beyond the scope of this noise variance and were not considered in this decision.

The former SMC Section 25.08.590 provides, in part, as follows:

"No variance shall be granted ... until the Administrator has considered the relative interests of the applicant, other owners or possessors of property likely to be affected by the noise and the general public... The Administrator may grant a variance, if he finds that:

- A. The noise occurring or proposed to occur does not endanger public health or safety; and
- B. The applicant demonstrates that the criteria required for. .. technical ... variance ... are met."

The requirements for a technical variance are contained in the former SMC Section 25.08.640 as follows:

"A technical variance may be granted by the Administrator on the ground that there is no practical means known or available for the adequate prevention, abatement or control of the noise involved. Any technical variance shall be subject to the holder's taking any alternative measures that the Administrator may prescribe. The duration of each technical variance shall be until such practical means for the prevention, abatement or control become known or available. The holder of a technical variance, as required by the Administrator, shall make reports to the Administrator detailing action taken to develop a means of noise control or to reduce the noise involved and must relate these actions to pertinent current technology."

In their application materials, the applicant provides examples of construction activities at the site which require continuous work for the activities to be performed in a safe and efficient manner. The application demonstrates that there is no practical means known or available for the adequate prevention, abatement, or control of the type of noise inherent in the construction of the tunnel and related surface support work necessary to safely perform the tunnel construction.

The applicant has also stated that there are other general public benefits of the variance including: an earlier completion of the project which will bring public transportation and other benefits to the populations served by the light rail line and substantial cost savings to the public. Some of the mitigation actions taken at the University Station site, such as the solid construction wall, will also provide a benefit during daytime hours of construction and would not otherwise be required by the code.

The application also includes a conceptual outline of a Construction Noise Management and Mitigation Plan which would be submitted by the contractor for approval by DPD prior to the commencement of nighttime construction activities. The plan includes prescriptive specifications for noise control at the construction site requiring the applicant's contractor to implement measures to establish compliance with the nighttime noise limits established in the variance application. The

applicant's proposal also includes procedures and programs for effectively monitoring, evaluating and resolving public complaints by taking appropriate corrective measures. DPD will act as an independent third party by providing oversight on night-time work to ensure that the public's interest is represented and that the contractor strictly adheres to the City's Noise Control Code and permit conditions.

The applicant has identified the closest residential area most likely to be affected by the nighttime noise, presented data on existing sound levels and projected construction sound levels, provided documentation of sound levels for specific activities and equipment and, as noted above, outlined required noise mitigation proposals to be followed by the contractor.

DPD retained the services of Bruck Richards Chaudiere Inc. ("BRC Acoustics") to assist in reviewing and analyzing the variance application. BRC Acoustics attended the public hearing, reviewed the applicant's original submittal and revised application, and reviewed written public comments, including technical comments prepared by another noise consultant who raised questions about the adequacy of the applicant's original noise study. BRC Acoustics prepared two written reports to DPD: 1) an acoustical review (dated June 18, 2009) of the applicant's original submittal, as revised in March 2009, and public comments received during the public hearing; and, 2) a technical review (dated September 28, 2009) of applicant's revised application, submitted in September 2009.

At the public hearing, several people stated that they were primarily concerned about the nighttime noise associated with off-site trucking activities performed in support of construction. Concerns were raised about the possibility of potential ill effects on residents from sound levels from trucks on Montlake Boulevard E., including potential loss or interference with sleep and a general degradation of the quality of life experienced by nearby residents living on or near Montlake Boulevard E. Subchapter IV of the Noise Control Code, former SMC 25.08.430 - .485, is entitled "Motor Vehicle Sound Levels" and imposes noise limits on motor vehicles. The applicant is not requesting a variance to exceed these Motor Vehicle Sound Levels and the construction activity that will generate truck traffic was approved in the prior Master Use Permit decisions issued in October, 2008 and February, 2009, which authorized the construction of the staging area and excavation of the tunnels and station area. The issue of sound levels from trucks on public roads that are associated with construction of this light rail project is beyond the scope of review under this variance application.

Sound Transit is the "lead agency" for purposes of SEPA compliance. A Final Supplemental Environmental Impact Statement (FSEIS) was issued by Sound Transit in April 2006 for the North Link light rail transit proposal which includes University Link. The actions proposed in this application (i.e., nighttime project sound levels during the construction phase) were disclosed and evaluated in the FSEIS. The Federal Transit Administration, acting as lead agency under the National Environmental Policy Act, issued its Record of Decision in June 2006.

FINDINGS

In accordance with Section 3 of DPD's Director's Rule 10-2005, the following standards and conditions were considered in reviewing the application.

1. The physical characteristics of the emitted sound

Construction of the University Link running tunnels operating from the University Station site will be by two tunnel boring machines. Although noise generated by underground tunnel boring operations and construction of the tunnel itself should not be noticeable at the surface, surface support operations for the underground mining and construction will require use of noise-producing heavy equipment, such as, but not limited to backhoes, bulldozers, muck trains, cranes, conveyers, concrete mixers and batch plants, delivery trucks, dump trucks and loaders, as well as smaller equipment such as air compressors, generators, and ventilation fans. The application, which includes a detailed technical noise study, lists the anticipated sound levels produced by the nighttime equipment that will be used on the site. The application also includes predicted nighttime project sound levels at the closest residential receiving sites and at the closest, most sensitive receiver on the University campus. The existing nighttime ambient conditions and the predicted project sound levels are summarized below.

During the period of June 22 to June 25, 2009, the applicant took measurements of existing ambient sound levels at two single-family residential sites identified as representative of nighttime noise-sensitive land uses close to the construction site. One of the residences is located on the east side of Montlake Boulevard E., and the other at the Far East end of E. Shelby Street, east of Montlake Boulevard E. The results of these measurements are set forth in the applicant's revised application and technical report submitted on September 15, 2009 and summarized below. The applicant also took measurements of ambient sound levels at two other sensitive noise receptors in late-2004 as part of the analysis included in the Environmental Impact Statement for the light rail project. One location was a non-residential land use, the Surgery Pavilion at the University Medical Center, and the other a single family residence located on E. Shelby Street, west of Montlake Boulevard E. These latter results are set forth in Table 3-1 of the original application submitted December 2, 2008 and summarized below.

The ambient nighttime sound levels in the residential neighborhood near the project site are primarily affected by traffic on Montlake Boulevard E. and State Route 520, both classified as state highways. Properties directly fronting on Montlake Boulevard E. experience higher ambient sound levels due to higher traffic volume on the arterial. The recent measurements at the two residential locations indicate that current average hourly ambient late nighttime sound levels (Leq), measured from 12 a.m. to 5 a.m. were 50 dBA at the easternmost location on E. Shelby Street and 59 dBA at the residence on Montlake Boulevard E. The measurement taken in late 2004 at a residence on E. Shelby Street, west of Montlake Boulevard E., was 54 dBA. In their report dated September 28, 2009, BRC indicates that the baseline value of 59 dBA measured at the Montlake Boulevard E. location is "too permissive to represent facades facing the project site". BRC suggests a lower baseline of 57 dBA be considered for the residences on Montlake Boulevard E and one adjacent residence on E. Shelby Street. BRC suggests a slightly lower baseline of 54 dBA for mid-block residences on E. Shelby Street, east of Montlake Boulevard E. compared to the ambient conditions modeled by the applicant which ranged from 54 to 57 dBA.

Based on the applicant's revised proposal (September 2009) to install a solid construction wall ranging in height from 12 to 22 feet on the southern boundary property as described in Alternative A, the applicant's predicted nighttime project sound levels at the residential receiving properties on E. Shelby Street and Montlake Boulevard E. range from 54 dBA to 56 dBA. The applicant proposes a nighttime project noise level limit at residential receiving properties of 56 dBA. The applicant also

requests an Lmax not to exceed 66 dBA, 10 dBA over the hourly average. Establishing the limit of 56 dBA would ensure that project sound levels would be no greater than 6 dBA over existing pre-project ambient conditions at residential receiving properties. Based on the applicant's predictions, the project sound levels will be equal to or less than existing pre-project ambient sound levels at a vast majority of residential receiving properties. Only three residences at the far east end of E. Shelby Street, east of Montlake Boulevard E., are predicted to have project sound levels above current ambient conditions: 3, 4 and 5 dBA respectively above ambient. This same result is true whether using the applicant's measured and modeled ambient sound levels or the slightly more conservative ambient condition (i.e., lower existing ambient) suggested by BRC.

The measured nighttime ambient sound level at the Surgery Pavilion is 62 dBA. Sound levels at this location are influenced by traffic noise from vehicles on NE Pacific Street and Montlake Boulevard NE, as well as from other activities on or near the University Medical Center. The applicant proposes a nighttime project noise level limit of 68 dBA at the Surgery Pavilion, with an allowance for an additional 10 dBA (Lmax) above this limit. This is consistent with the variance requested for the residential properties to the south, i.e., a maximum project noise level limit of no greater than 6 dBA above existing ambient conditions. DPD did not receive any written comments on this noise variance from the University of Washington.

2. The times and duration of the emitted sound

As noted in the Background section of the decision, the applicant is requesting a variance to work from 10 p.m. to 7 a.m. on weekdays and from 10 p.m. to 9 a.m. on weekends and legal holidays for work associated with the construction of the light rail tunnel during an approximate two-year time period, potentially starting as early as late 2010 and ending by early 2013.

3. The geography, zone and population density of the affected area

The subject construction site is located on the University of Washington campus, fronting on the east side of Montlake Boulevard NE, generally south and east of Husky Stadium, north of the Lake Washington Ship Canal. The total area of the construction staging area is approximately six acres. On October 23, 2008, DPD approved Master Use Permit (MUP) 3008164 which authorized the use of this construction staging area for the light rail construction project under the provisions of SMC 23.42.040(F).

The zoning of the project site and the entire University campus is regulated by the University of Washington Major Institution Overlay District (MIO). The underlying zoning of the majority of the site is Midrise (MR). The underlying zoning of the southernmost portion of the site within Shoreline Management jurisdiction is Lowrise 1 (L-1). The land uses immediately adjacent to the construction site within the University campus include Husky Stadium to the north and east, educational buildings and other University athletic facilities to the north, an underground parking facility and plaza to the west, surface parking to the southeast, and the University Medical Center and Surgery Pavilion to the southwest.

Single-family residential land uses are located to the south of the project site, south of the Lake Washington Ship Canal. These properties are zoned Residential, Single Family 5000 (SF 5000).

4. Whether the public health and safety are endangered

It is generally accepted that very high levels of noise have adverse physical impacts on humans including, but not limited to, hearing damage. Many standards apply to occupational exposures at high levels for prolonged periods of time. For example, the Occupational Safety and Health Act mandates a hearing conservation program by employers if sound levels exceed 85 dBA continuously over an 8-hour workday. If sound levels exceed 90 dBA continuously over an 8-hour workday hearing protection is required. The project sound level limits proposed under this Variance Application will maintain sound levels well below the 85 dBA level, in a range where no hearing protection is required.

The amount of noise that can cause sleep disruption or deprivation can vary significantly from person to person. The results of the Federal Aviation Administration Report No. F.AA-EE-85-2 titled Aviation Noise Effects show that 10% of the population studied experienced awakening from sleep at single-event maximum sound levels of 50 dBA and experienced a change in sleep state at single-event maximum sound levels of 39 dBA. Since typical northwest residential construction affords approximately 25 dBA of noise reduction between exterior and interior sound levels, the corresponding exterior sound levels producing sleep disturbance are single-event maximum sound levels of 75 dBA and 64 dBA, respectively. It should be noted that these studies involved aviation rather than construction noise and responses to construction noise may differ.

The increases from on-site nighttime project sound levels that are sought by the applicant and the resulting noise levels will likely affect some people but are not expected to cause a danger to public health or safety. An attempt was made to address the impact of short-duration single events by imposing sound level limits on the hourly Lmax in addition to the hourly Leq.

5. Relative interests of the applicant, other owners or possessors of property likely to be affected by the noise, and the general public

The interests of the applicant are described in the application. While the conditions imposed on this variance will require additional effort and flexibility on the part of the applicant, they are not expected to cause undue hardship. The applicant appropriately identifies that the most affected residential receiving properties are located on E. Shelby Street and Montlake Boulevard E., directly to the south of the proposed construction. By increasing the southern wall height, and implementing other mitigation measures described in the application, on-site project sound levels are reduced to insignificant levels at most all properties, and only a moderate level of impact, as determined by BRC, at one residential property. Although there will be a higher cost to the applicant to construct the higher wall, it will provide a public benefit by reducing project sound levels to reasonable limits at the closest residential receiving properties. The preponderance of information suggests that the interests of the general public will be served by the safe completion of this transportation project and by the expected shorter overall construction period if nighttime construction activity is allowed.

The revised application (dated March 16, 2009) describes mitigation proposed by the applicant to implement the Noise Compliance Tracking provisions described in Section 5.0 of the application, including sub-sections 5.1 (Sound Leveling Monitoring) and 5.2 (Variance Noncompliance Resolution). DPD shall act as an independent third party by providing oversight of the night-time work to ensure the public's interests are protected and that the contractor strictly adheres to the City's Noise Control Code and permit conditions. DPD shall assign a Noise Abatement Specialist who will serve as the city's primary contact for noise related issues at this site. Moreover, representatives of the applicant with authority to stop work will be present on the project site during all work hours to ensure that mitigation measures are being followed.

Per the proposed mitigation, the applicant shall also implement the Public Outreach and Community Involvement provisions described in Section 6.0 of the application as revised on March 16, 2009. The DPD Noise Abatement Specialist shall be responsible for receiving and responding to night time noise complaints through the Sound Transit 24-hour construction hotline (as provided in Section 5.0 and 6.0 of the application.)

6. Whether the sound source predates the receiver(s)

The sound source does not predate the receivers.

7. Whether compliance with the standard(s) from which the variance is sought would produce hardship without equal or greater benefit to the public

There is no other practical means known or available for the adequate prevention, abatement or control of the type of on-site noise proposed by the applicant such that the applicant's project may proceed to be built and at the same time remain within the sound level requirements imposed by the code on nighttime activities.

The applicant has demonstrated that operating the TBMs on a 24-hour basis is the most efficient and safest way to excavate a tunnel. Frequent stopping and/or starting of the TBM increases risks of ground movements around the TBM and concrete tunnel lining, which could lead to additional settlements and/or convergence of ground onto the TBM putting worker safety in jeopardy and possibly causing the TBM to become stuck. Noise-producing above-ground construction activities and equipment are required to support around the clock operation of the TBM. Ventilation fans and power generators are needed at the surface to provide fresh air to the workers in the tunnel and a reliable power source for the underground equipment. Above-ground loading and unloading of materials to and from the tunnel and removal of muck from the tunnel is also required to efficiently maintain continuous tunneling operations.

Noise generated from the above-ground work needed to support tunnel operations cannot comply with the nighttime sound level required by the Noise Control Code. The only way to comply with these sound level limits is to prohibit tunneling during nighttime hours. To do so would cause unsafe working conditions and would produce a hardship to the public because it would take longer and add more cost to complete the project.

CONCLUSIONS

1. Findings numbers 1 through 7 above are adopted as Conclusion number 1.
2. Proper notice was given of the proposed variance and the required public hearing took place.
3. There are no practical means known or available for the adequate prevention, abatement or control of the noise from the project's nighttime construction activities. It is not practical to stop tunnel construction activities at night without increasing danger to workers in the tunnel and substantially lengthening the time to complete the project.
4. Practical known and available mitigation measures for reducing the nighttime project sound levels and their effects on nearby residents are described in the application (Technical Noise Analysis and Recommended Mitigation Plan dated December 2, 2008, the revised Technical

Noise Variance Application for Nighttime Construction Noise dated March 16, 2009, the Response to Expert Comments on Technical Noise Analysis, Recommended Mitigation Plan dated September 14, 2009 and the Response to Comments and Revisions to Application for Technical Noise Variance letter from Sound Transit to DPD dated September 15, 2009) and will be incorporated into the project.

5. Chapter 25.08 provides adequate authority to mitigate the impacts of nighttime construction activity at the subject site and, pursuant to the SEPA Overview Policy in SMC 25.05.665; no additional mitigation is required pursuant to SEPA.
6. Based upon the written information submitted by the applicant and interested citizens, statements made at the public hearing, federal guidelines and the current body of scientific knowledge, there is no known danger to public health and safety if mitigating measures are put in place and followed, as provided in this Decision and Order.

DECISION AND ORDER

This variance is GRANTED for the noise related to the nighttime construction activities described in this Analysis and Decision and the applicant's submittal of December 2, 2008, subject to the following:

1. This variance is subject to the conditions set forth below and to all requirements, specifications, standards, limits, and other mitigation measures identified by the applicant in its original application submitted on December 2, 2008, as revised in the March 16, 2009 and September 15, 2009 submittals, collectively "the application". Specifically, the applicant is required to fully follow and execute all of the noise control measures identified in the application and its appendices and attachments in addition to the provisions set forth in this Decision and Order. If there is a conflict between the noise mitigation and control requirements or specifications of the application and this Decision and Order, the requirements of this Decision and Order shall be followed.
2. Nighttime project sound levels shall not exceed 56 dBA (Leq) at residential receiving properties to the south of the project site and 68 dBA at the University Medical Center. An Lmax of 10 dBA over the maximum allowable Leq limit shall also be allowed at these receiving sites. These sound level limits are intended to ensure that nighttime project sound levels will not exceed the ambient sound level by more than 6 dBA (Leq) during the following schedule:

Weekdays 10:00 p.m. to 7:00 a.m.

Weekends (including legal holidays) 10:00 p.m. to 9:00 a.m.

3. All solid construction walls proposed by the applicant shall be installed prior to commencement of nighttime noise-producing construction activities on the site. The height of the southernmost solid construction wall shall be consistent with Alternative A, with a varying height of at least 12 to 22 feet in height, as described in the applicant's September 15, 2009 submittal.

4. The applicant shall require its contractor to prepare a Construction Noise Management and Mitigation Plan as described in Sub-section 4.5 of the application. This Plan shall be reviewed and approved by DPD prior to commencement of nighttime construction activities at the site. Additionally, locations of all off-site noise monitoring sites proposed by the applicant and/or its contractor shall be subject to review and approval by DPD.
5. The applicant shall notify the Administrator and those community members originally included in the original application two weeks prior to the commencement of activity that is subject to this variance. The form and content of the notification shall be proposed by the applicant and approved by the Administrator.
6. This variance shall expire twenty-four (24) months from the commencement of nighttime construction.
7. Violation of any condition of this variance will result in a review of the conditions imposed by this variance, imposition of new conditions, or possible revocation of this variance.

Dated this 5th of November, 2009

Diane Sugimura, Director

Department of Planning and Development

& Administrator, Chapter 25.08 of the Seattle Municipal Code

APPEAL

The Noise Control Code SMC 25.08 provides that any person aggrieved by the denial, grant, or the terms and conditions on the grant of an application for a variance or renewal of a variance by the Administrator may appeal such decision to the City of Seattle. Hearing Examiner pursuant to the provisions of the Seattle Municipal Code Section 25.08.610. The written notice of appeal shall include the following: the legal interest of the appellant in the property or equipment involved in the decision, a brief statement in concise language of the specific action protested, together with any material facts claimed to support the contentions raised in the appeal; a brief statement of the relief sought, and the reason why it is claimed that the protested action should be reversed, modified or otherwise set aside, the signatures of all parties named as appellants and their mailing addresses, the verification (by declaration under penalty of perjury) of at least one (1) appellant as to the truth of the matters asserted in the appeal is also required.

Appeals of this decision must be received by the Hearing Examiner no later than ten days following the date of the decision and be accompanied by a check for \$_____ made payable to the City of Seattle.